

CLAIMS

1. (Original) A current output type drive circuit for outputting a drive current to a driven object shared by being divided into a plurality of areas,

comprising a plurality of drivers arranged corresponding to each the shared area of the driven object,

each driver comprising

an output means for outputting a supplied reference current and the drive current corresponding to image data to a corresponding shared area of the driven object and

a reference current source circuit for sampling and holding the reference current input from a reference current input terminal, then supplying the same to the output means.

2. (Original) A current output type drive circuit as set forth in claim 1, wherein said reference current source circuit comprises at least:

a current sampling circuit including a current memory for sampling and holding said reference current in accordance with a control signal and

a control circuit for outputting to said current sampling circuit a control signal for controlling write and read operations of said reference current of the current memory of said current sampling circuit.

3. (Original) A current output type drive circuit as set forth in claim 2, wherein said current sampling circuit includes a first current memory and a second current memory, and

said control circuit outputs to said current sampling circuit said control signal so as to alternately perform a write operation of the reference current input from said reference current input terminal and a read operation of the written reference current on said first current memory and second current memory.

4. (Original) A current output type drive circuit as set forth in claim 2, wherein said output means

includes a plurality of current output type digital/analog conversion circuits and

the circuit comprises means for increasing the reference current read from the current memory of the current sampling circuit of said reference current source circuit to a plurality of reference currents by further copying or distributing them by time division, and

said plurality of reference currents are supplied to said plurality of digital/analog conversion circuits.

5. (Original) A current output type drive circuit as set forth in claim 4, wherein each driver is a driver outputting currents of a plurality of channels in accordance with input data,

further comprises a register array for holding said input data, and

further comprises means for increasing the reference current sampled and held by the reference current source circuit to a plurality of reference currents by further copying or distributing them by time division, and

said output means comprises

a plurality of conversion circuits for receiving said plurality of reference currents and outputting currents in accordance with the data held by the register array and

a current output circuit comprising a first group of current sampling circuits and a second group of current sampling circuits operating alternately in a current write mode and current read mode in accordance with the output currents of the conversion circuits.

6. (Original) A current output type drive circuit as set forth in claim 5, wherein

said input data is digital image data,

the circuit comprises means for distributing the reference current to the drivers in a vertical blanking period during which operations on said image data are suspended, and

each driver uses as the reference current the current held in the reference current source circuit of the driver after the vertical blanking period in which digital noise is generated along with transfer of said image data.

7. (Original) A current output type drive circuit for outputting a drive current to a driven object shared by being divided into a plurality of areas,

comprising a plurality of drivers arranged corresponding to each the shared area of the driven object,

each driver comprising
an output means for outputting a supplied reference current as a drive current to the corresponding shared area of the driven object and
a reference current source circuit for sampling and holding a reference current input from a reference current input terminal, then supplying the same to the output means,
the reference current input terminal being connected to a reference current input terminal of another driver by a common current interconnect, and
the reference current being distributed to the reference current source circuits of the drivers by time division.

8. (Original) A current output type drive circuit as set forth in claim 7, wherein each driver fetches said reference current from said reference current input terminal to said reference current source circuit when receiving a signal indicating start of distribution of the reference current and outputs the signal indicating the start of distribution of reference current to the driver circuit of the next stage.

9. (Original) A current output type drive circuit as set forth in claim 8, wherein each driver comprises a data memory, writes input data into said data memory when receiving a first signal indicating start of writing of data and outputs said first signal indicating start of writing of data to the driver of the next stage and fetches said reference current from said reference current input terminal to said reference current source circuit in synchronization with said first signal when receiving a second signal indicating start of distribution of reference current and outputs said second signal indicating start of distribution of reference current to the driver circuit of the next stage.

10. (Original) A current output type drive circuit as set forth in claim 7, wherein said reference current source circuit comprises at least:

a current sampling circuit including a current memory for sampling and holding said reference current in accordance with a control signal and

a control circuit for outputting to said current sampling circuit a control signal for controlling write and read operations of said reference current of the current memory of said current sampling circuit.

11. (Original) A current output type drive circuit as set forth in claim 10, wherein

said current sampling circuit includes a first current memory and a second current memory, and

said control circuit outputs to said current sampling circuit said control signal so as to alternately perform a write operation of the reference current input from said reference current input terminal and a read operation of the written reference current on said first current memory and second current memory.

12. (Original) A current output type drive circuit as set forth in claim 10, wherein said output means

includes a plurality of current output type digital/analog conversion circuits and the circuit comprises means for increasing the reference current read from the current memory of the current sampling circuit of said reference current source circuit to a plurality of reference currents by further copying or distributing them by time division, and

said plurality of reference currents are supplied to said plurality of digital/analog conversion circuits.

13. (Original) A current output type drive circuit as set forth in claim 7, wherein at least the reference current source circuit of the driver serving as a master includes a reference current source circuit generating a reference current and supplying it to said common current interconnect.

14. (Original) A current output type drive circuit as set forth in claim 10, wherein at least the reference current source circuit of the driver serving as a master includes a reference current source circuit generating a reference current and supplying it to said common current interconnect.

15. (Original) A current output type drive circuit as set forth in claim 7, wherein

each driver is a driver outputting currents of a plurality of channels in accordance with input data,

further comprises a register array for holding said input data, and

further comprises means for increasing the reference current sampled and held by the reference current source circuit to a plurality of reference currents by further copying or distributing them by time division, and

said output means comprises

a plurality of conversion circuits for receiving said plurality of reference currents and outputting currents in accordance with the data held by the register array and

a current output circuit having a first group of current sampling circuits and a second group of current sampling circuits operating alternately in a current write mode and current read mode in accordance with the output currents of the conversion circuits.

16. (Original) A current output type drive circuit as set forth in claim 15, wherein
said input data is digital image data,
the circuit comprises means for distributing the reference current to the drivers in a vertical blanking period during which operations on said image data are suspended, and
each driver uses as the reference current the current held in the reference current source circuit of the driver after the vertical blanking period in which digital noise is generated along with transfer of said image data.

17. (Original) A current output type drive circuit as set forth in claim 7, wherein the interconnect of said reference current is arranged between power supply interconnects for shield.

18. (Original) A current output type drive circuit as set forth in claim 7, wherein the interconnect of said reference current, when a multilayer interconnect including a power supply layer for shield, is arranged at a top layer of said power supply layer for shield.

19. (Original) A current output type drive circuit as set forth in claim 7, further comprising means for suppressing great fluctuations of the potential of said common reference current interconnect when the circuits sampling and holding the reference currents of the drivers are all off.

20. (Original) A current output type drive circuit as set forth in claim 12, wherein
said means increasing said reference current to a plurality of reference currents comprises a current mirror circuit configured by a constant current source including resistor elements arranged at the input stage and a plurality of reference current sources including resistor elements arranged at the output stage in parallel so as to correspond to the output parts of said output means, and
the resistor elements of the reference current sources arranged at the two ends among said plurality of reference current sources are arranged close to the resistor elements of said constant current source.

21. (Original) A current output type drive circuit as set forth in claim 20, wherein the resistor elements forming the reference current sources are laid out divided and cross-laced.

22. (Original) A display device for outputting a drive current to a shared area of a display panel shared by being divided into a plurality of areas,

comprising a plurality of drivers arranged corresponding to each the shared area of the display panel,

each driver comprising an output means for outputting a supplied reference current to a corresponding shared area of the driven object and

a reference current source circuit for sampling and holding the reference current input from a reference current input terminal, then supplying the same to the output means.

23. (Original) A display device for outputting a drive current to a shared area of a display panel shared by being divided into a plurality of areas,

comprising a plurality of drivers arranged corresponding to each the shared area of the display panel,

each driver comprising

an output means for outputting a supplied reference current to a corresponding shared area of the driven object and

a reference current source circuit for sampling and holding a reference current input from a reference current input terminal, then supplying the same to the output means,

the reference current input terminal being connected to a reference current input terminal of another driver by a common current interconnect, and

the reference current being distributed to the reference current source circuits of the drivers by time division.

24. (Original) A display device as set forth in claim 23, wherein each driver fetches said reference current from said reference current input terminal to said reference current source circuit when receiving a signal indicating start of distribution of reference current and outputs the signal indicating start of distribution of reference current to the driver circuit of the next stage.

25. (Original) A display device as set forth in claim 23, wherein each driver comprises a data memory, writes input data into said data memory when receiving a first signal indicating start

of writing of data and outputs said first signal indicating start of writing of data to the driver of the next stage and fetches said reference current from said reference current input terminal to said reference current source circuit in synchronization with said first signal when receiving a second signal indicating start of distribution of reference current and outputs said second signal indicating start of distribution of reference current to the driver circuit of the next stage.

26. (Original) A display device as set forth in claim 23, wherein the interconnect of said reference current is arranged between power supply interconnects for shield.

27. (Original) A display device as set forth in claim 23, wherein the interconnect of said reference current, when a multilayer interconnect including a power supply layer for shield, is arranged at a top layer of said power supply layer for shield.

28. (Original) A display device as set forth in claim 23, further comprising means for suppressing great fluctuations of the potential of said common reference current interconnect when the circuits sampling and holding the reference currents of the drivers are all off.